CLAIMS

1. A method for estimating the transfer function of a transmission channel (C) over which a pilot signal (P-CPICH) and a data signal (DPCH) are transmitted, said pilot signal being comprised of sets of known symbols each transmitted over a given time slot, and said data signal including dedicated pilot fields comprised of respective sets of known symbols each transmitted over a respective time slot, the method including the steps of:

- obtaining (21, 22, 27; 24, 23, 25) first and second channel estimates from said pilot signal and said data signal, respectively, and
- combining (26) said first and second channel estimates to obtain final combined channel estimates,

characterized in that it includes the steps of:

- obtaining (21, 22, 27; 24, 23, 25) said first and second channel estimates over a basic estimation reference time (T),
- interpolating said second channel estimates over said basic estimation reference time (T) to produce a number of interpolated second channel estimates over said basic estimation reference time (T) derived from said data signal equal to the number of said first channel estimates over said basic estimation reference time (T) derived from said pilot signal, and
- obtaining said final combined channel estimates as a sum (26) of said first channel estimates and said interpolated second channel estimates.

2. The method of claim 1, characterized in that it includes the step of mapping at least one of said first and second channel estimates onto said basic estimation reference time (T).

3. The method of claim 1, characterized in that it includes the steps of:

- obtaining said first channel estimates over a respective estimation reference time, and

- selecting said basic estimation reference time (T) equal to said respective estimation reference time.

4. The method of claim 3, characterized in that it includes the step of mapping said second channel estimates onto said respective estimation reference time.

5. The method of claim 1, characterized in that it includes the step of obtaining said final combined channel estimates as a weighted sum of said first channel estimates and said interpolated second channel estimates.

6. The method of claim 2, characterized in that said step of mapping includes the steps of:

- integrating said at least one of said first and second channel estimates over said basic estimation reference time (T), if the length of said given time slot or respective time slot is shorter than said basic estimation reference time (T),

- splitting said at least one of said first and second channel estimates over a plurality of said basic estimation reference times, if the length of said given time slot or respective time slot is longer than said basic estimation reference time (T).

7. The method of claim 6, characterized in that said step of splitting in turn includes the operations of:

- splitting said at least one of said first and second channel estimate into corresponding estimates associated to a plurality of said basic estimation reference times (T), if said at least one of said first and second channel estimates has been evaluated over a

slot larger than said basic estimation reference time (T), and

- integrating said at least one of said first and second channel estimate over said basic estimation reference time (T), if said at least one of said first and second channel estimates has been evaluated over a slot smaller than said basic estimation reference time (T).

8. The method of claim 1, characterized in that said interpolation is a linear interpolation.

9. The method of claim 1, characterized in that said interpolation is an interpolation of second channel estimates obtained from two subsequent dedicated pilot fields (L, L-1) in said data signals.

10. The method of claim 1, characterized in that said first channel estimates are obtained by decoding said known symbols associated with the pilot signal (P-CPICH) over a given decoding time epoch by correlating them with reference pilot symbols.

11. The method of claim 10, characterized in that said step of decoding includes the operations of:

- if transmit diversity is adopted for said transmission channel, performing said correlation over a time equal to twice said decoding time epoch, and

- if transmit diversity is not adopted for said transmission channel, performing correlation over a time equal to said decoding time epoch basic.

12. The method of claim 1, characterized in that said second channel estimates are obtained from said data signals by decoding said dedicated pilot fields over a plurality of subsequent data symbols equal to a respective decoding time epoch and by correlating said decoded data symbols with reference data pilot symbols.

13. The method of claim 12, characterized in that said step of decoding includes the operations of:

- if transmit diversity is active over said transmission channel, performing said correlation over the entire respective decoding time epoch, and

- if transmit diversity is not active over said transmission channel, performing said correlation on a symbol-by-symbol basis.

14. The method of claim 1, characterized in that said step of obtaining (21, 22, 27) said first channel estimates from said pilot signal includes the step of performing a moving average operation (22) over estimates of said pilot signal.

15. The method of claim 2, characterized in that said step of obtaining (21, 22, 27) said first channel estimates from said pilot signal includes the step of performing a moving average operation (22) over estimates of said pilot signal, wherein said mapping operation (27) is performed downstream of said moving average operation (22).

16. The method of claim 1; characterized in that said transmission channel is a CDMA transmission channel.

17. A system for estimating the transfer function of a transmission channel (C) over which a pilot signal (P-CPICH) and a data signal (DPCH) are transmitted, said pilot signal being comprised of sets of known symbols each transmitted over a given time slot, and said data signal including dedicated pilot fields comprised of respective sets of known symbols each transmitted over a respective time slot, the system including:

- at least one estimator (21, 22, 27; 24, 23, 25) for producing first and second channel estimates from said pilot signal and said data signal, respectively, and

- a combination node (26) for combining said first and second channel estimates to obtain final combined channel estimates,

characterized in that:

- said at least one estimator (21, 22, 27; 24, 23, 25) is configured for obtaining said first and second channel estimates over a basic estimation reference time (T),

- an interpolator module (25) is provided for interpolating said second channel estimates over said basic estimation reference time (T) to produce a number of interpolated second channel estimates over said basic estimation reference time (T) derived from said data signal equal to the number of said first channel estimates over said basic estimation reference time (T) derived from said pilot signal, and

- said combination node is a summation node (26) producing said final combined channel estimates as a sum (26) of said first channel estimates and said interpolated second channel estimates.

18. The system of claim 17, characterized in that it includes at least one rate adaptation module (23, 27) configured for mapping at least one of said first and second channel estimates onto said basic estimation reference time (T).

19. The system of claim 17, characterized in that said at least one estimator (21, 22, 27) is configured for obtaining said first channel estimates over a respective estimation reference time, and in that said interpolator module (25) is configured for interpolating said second channel estimates over a basic estimation reference time (T) equal to said respective estimation reference time.

20. The system of claim 19, characterized in that it includes a rate adaptation module (23) configured for mapping said second channel estimates onto said respective estimation reference time.

21. The system of claim 17, characterized in that said combination node is a weighted summation node (26) producing said final combined channel estimates as a weighted sum of said first channel estimates and said interpolated second channel estimates.

22. The system of claim 18, characterized in that said at least one rate adaptation module (23, 27) is configured for performing said mapping by:

- integrating said at least one of said first and second channel estimates over said basic estimation reference time (T), if the length of said given time slot or respective time slot is shorter than said basic estimation reference time (T),

- splitting said at least one of said first and second channel estimates over a plurality of said basic estimation reference times, if the length of said given time slot or respective time slot is longer than said basic estimation reference time (T).

23. The system of claim 22, characterized in that said at least one rate adaptation module (23) is configured for:

- splitting said at least one of said first and second channel estimate into corresponding estimates associated to a plurality of said basic estimation reference times (T), if said at least one of said first and second channel estimates has been evaluated over a slot larger than said basic estimation reference time (T), and

- integrating said at least one of said first and second channel estimate over said basic estimation reference time (T), if said at least one of said first

and second channel estimates has been evaluated over a slot smaller than said basic estimation reference time (T).

24. The system of claim 17, characterized in that said interpolator module (25) is a linear interpolator module.

25. The system of claim 17, characterized in that said interpolator module (25) is configured for performing an interpolation of second channel estimates obtained from two subsequent dedicated pilot fields (L, L-1) in said the data signals.

26. The system of claim 17, characterized in that said at least one estimator module (21) is configured for producing said first channel estimates by decoding said known symbols associated with the pilot signal (P-CPICH) over a given decoding time epoch by correlating them with reference pilot symbols.

27. The system of claim 26, characterized in that said at least one estimator module (21) is configured for:

- if transmit diversity is adopted for said transmission channel, performing said correlation over a time equal to twice said decoding time epoch, and
- if transmit diversity is not adopted for said transmission channel, performing correlation over a time equal to said decoding time epoch.

28. The system of claim 17, characterized in that said at least one estimator module (24) is configured for producing said second channel estimates from said data signals by decoding said dedicated pilot fields over a plurality of subsequent data symbols equal to a respective decoding time epoch and by correlating said decoded data symbols with reference data pilot symbols.

29. The system of claim 28, characterized in that said at least one estimator module (24) is configured for:

- if transmit diversity is active over said transmission channel, performing said correlation over the entire respective decoding time epoch, and

- if transmit diversity is not active over said transmission channel, performing said correlation on a symbol-by-symbol basis.

30. The system of claim 17, characterized in that said at least one estimator module (21) for producing said first channel estimates from said pilot signal includes a moving average module for performing a moving average operation (22) over estimates of said pilot signal.

31. The system of claim 18, characterized in that said at least one estimator module (21) for producing said first channel estimates from said pilot signal includes a moving average module for performing a moving average operation (22) over estimates of said pilot signal and in that said rate adaptation module (27) is arranged downstream of said moving average module (22).

32. A receiver for receiving digital signals over a transmission channel (C) over which a pilot signal (P-CPICH) and a data signal (DPCH) are transmitted, said pilot signal being comprised of sets of known symbols each transmitted over a given time slot, and said data signal including dedicated pilot fields comprised of respective sets of known symbols each transmitted over a respective time slot, the receiver characterized in that it includes a system according to any of claims 17 to 31.

33. The receiver of claim 32, characterized in that said receiver is a CDMA receiver.

34. A computer program product loadable in the memory of at least one computer and comprising software code portions for performing the method of any of claims 1 to 16.